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Plant Disease Update

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Plant Diseases Affect Crop Quality & Yield

- Reduce photosynthesis
- Result in flower and head infections

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Plant Diseases Affect Crop Quality & Yield

- Reduce root growth/uptake
- Restrict stem flow

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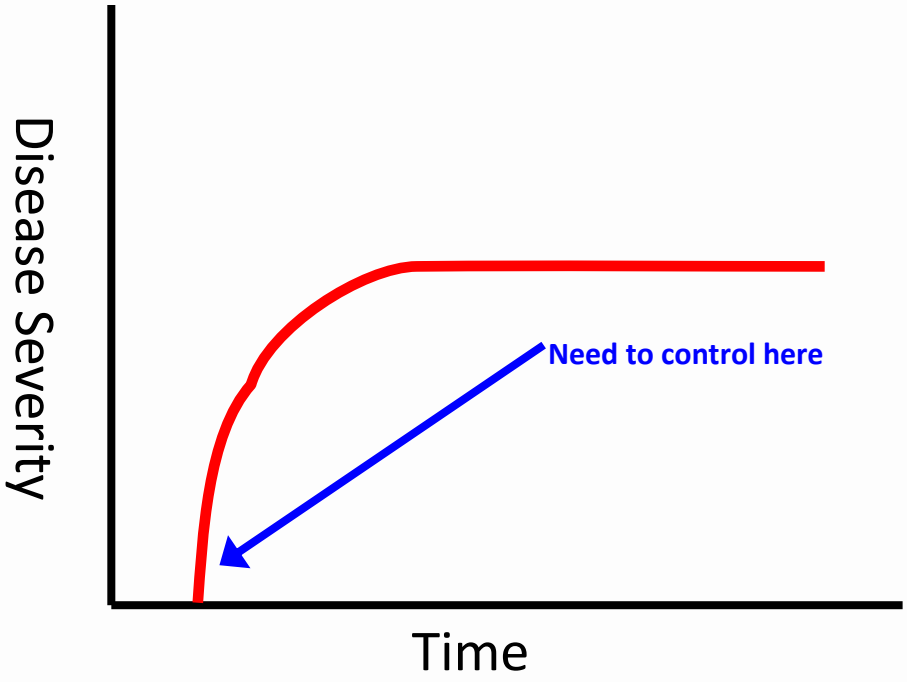
How pathogens are spread…



- Mono-cyclic diseases are those that have **only 1 infection cycle per season**
  - One main release of spores
  - Or, only one time that the host is susceptible
- You need to control it at the start of its infection cycle
  - Too late once you see disease symptoms

Take-home message:
Instead of scouting for symptoms to determine risk … you need to scout for the conditions that favour disease.

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Mono-cyclic Disease

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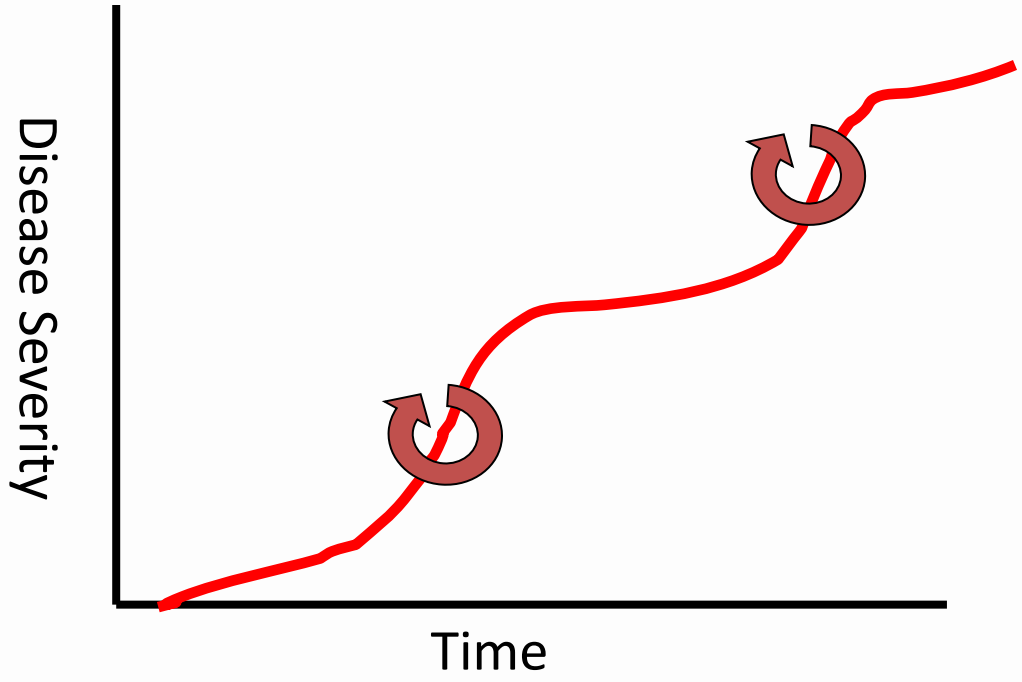
How pathogens are spread…



- Poly-cyclic diseases are those that have **>1 infection cycle per season**
  - Multiple spore releases
  - Plant is susceptible over a longer period of time
- Scout for early symptoms, then provide control to stop additional infections

Take-home message:
Greater chance of success for control measures, but need to act before too many cycles have occurred.

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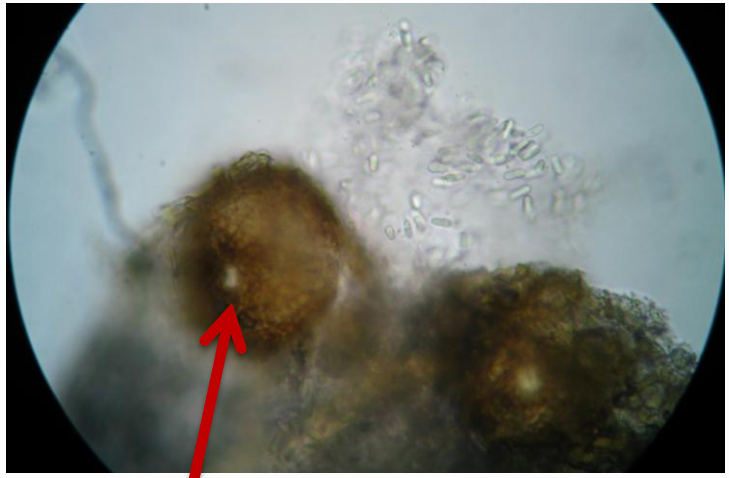
Poly-cyclic Diseases



Integrated Disease Management

- Crop rotation/diversity
  - ↑ decomposition of infested residues
  - ↓ pathogen viability/ability to infect
- Identify potential issues in each field
  - Assess risk and plan/respond accordingly
- Get crops off to a good start
  - Agronomics, fertility, variety choice, seed health
- Long-term management of multiple crop health issues
  - No “perfect timing” to apply all pesticide products
  - Prolong the usefulness of disease resistance
  - Lower risk of fungicide insensitivity

Fungicide Timing in Pulse Crops

www.youtube.com/user/AGSask

Diseases of Dry Bean in Saskatchewan

- White mould (*Sclerotinia sclerotiorum*)
  - Variety selection
  - Crop rotation
  - Fungicide application, at early flowering
- Bacterial blight
  - Seed-borne
  - Spreads through wounds (such as pivot damage)
  - Copper-based seed treatments and foliar sprays

For more information search, “Management of Irrigated Dry Beans” on the Saskatchewan Ministry of Agriculture website.

Introduction to Aphanomyces root rot

- *Aphanomyces* has been confirmed in diverse areas of the province
- *Aphanomyces* affects pea, lentil, bean, vetch, clover, alfalfa.
- Chickpea, canola, flax, soybean, cereal crops, and some cultivars of fababean are susceptible to other root rots, but not *Aphanomyces*
- Current seed treatments will not address the *Aphanomyces* problem, but manage other root rots that may be present (*Pythium*, *Fusarium*)

Root rots and too much water

- Disease severity is higher under wet conditions
- However, pulse crops will suffer under waterlogged conditions even *without* pathogen pressure

Leoville soil sample, peas grown in greenhouse under normal watering

Symptoms are best assessed early. Look for caramel roots!

Courtesy of Cheryl Armstrong-Cho, Crop Development Centre

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Flax Diseases

- Pasmo (*Septoria linicola*)
  - Observed in 86% of flax crops surveyed in SK/MB in 2013, especially those surveyed in September
  - Trace to 5% severity (stem area affected) in crops surveyed in August but disease developed towards the end of the season to reach 5% to 20% in most crops, and up to 40% in most severe
  - Headline registered for control of pasmo in flax (mid-flower)
  - Most commercial varieties no resistance to this disease
- Sclerotinia
  - Flax is a host, can serve to maintain disease inoculum
  - However, symptoms were not observed in any of the flax crops surveyed in 2013
  - Proline registered for control
- Fusarium wilt - 56%
  - Resistant varieties
- Powdery mildew - 24%
  - Some resistance avail
- Traces of Aster yellows - 16%

Rhashid, et al. Canadian Plant Disease Survey, volume 94 (in press)

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Annual Canola Disease Survey

- Fields are either volunteered by growers or selected randomly.
- Canola diseases recorded as present or absent on 100 plants per field:
  - severity assessed for some diseases
  - 268 canola crops surveyed in 2013
- Report will be submitted to the Canadian Plant Disease Survey:
  - www.cps-scp.ca/cpds.shtml
- Thanks to everyone who helps out with this survey each year!

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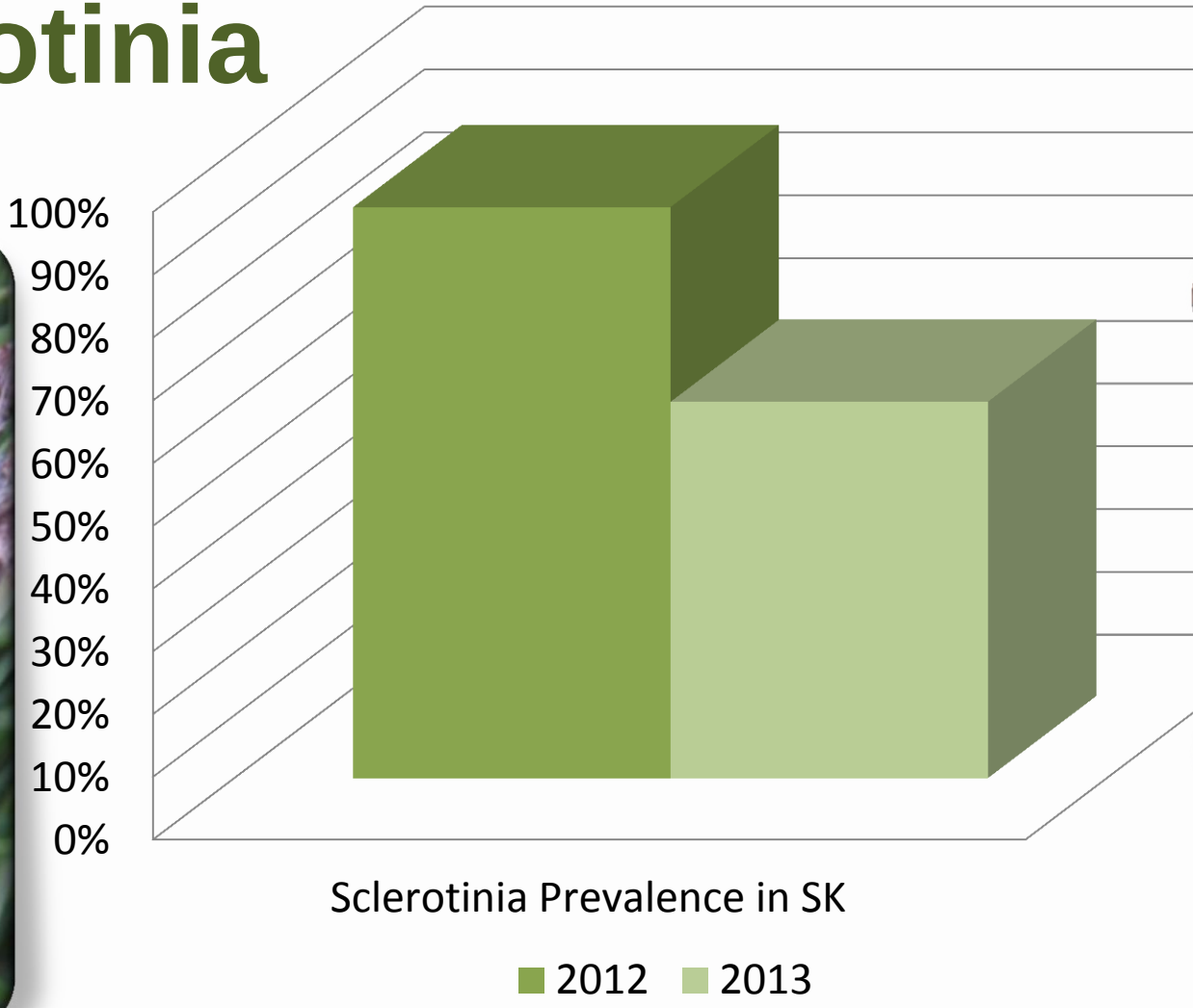
Sclerotinia



60% of crops surveyed in had at least a trace of sclerotinia in 2013

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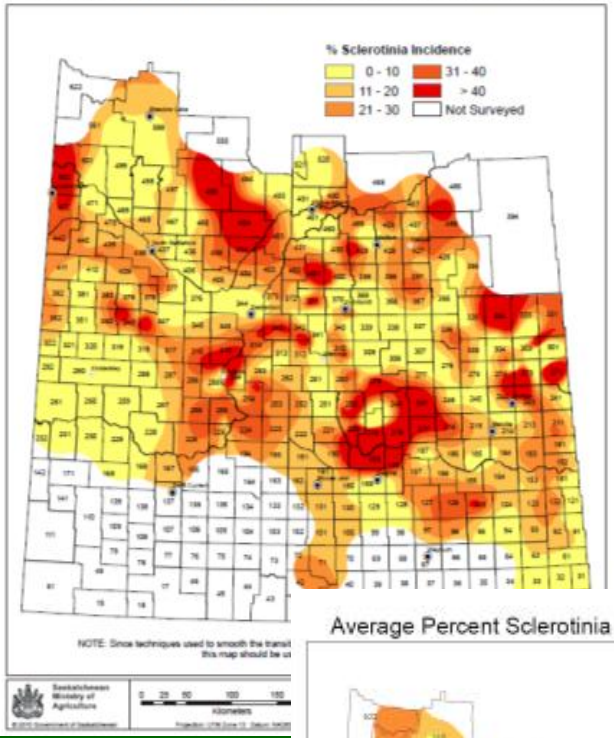
Average Per Cent Sclerotinia Incidence in Canola - 2010



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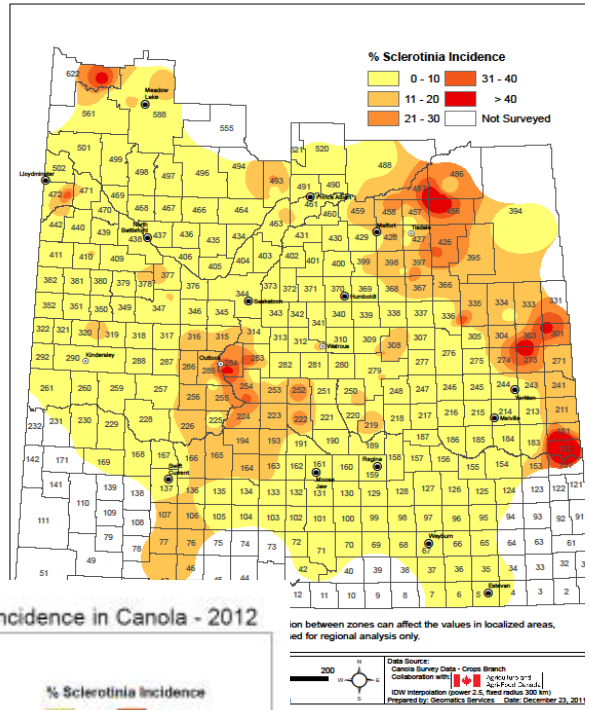

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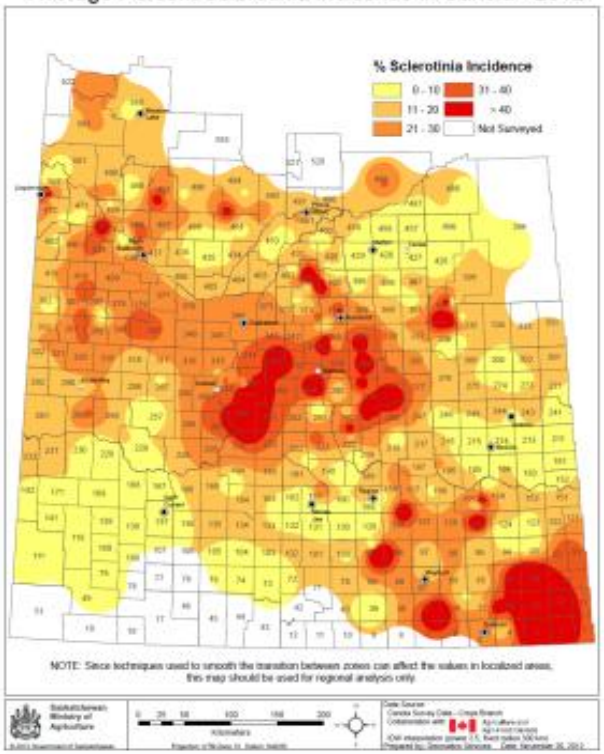
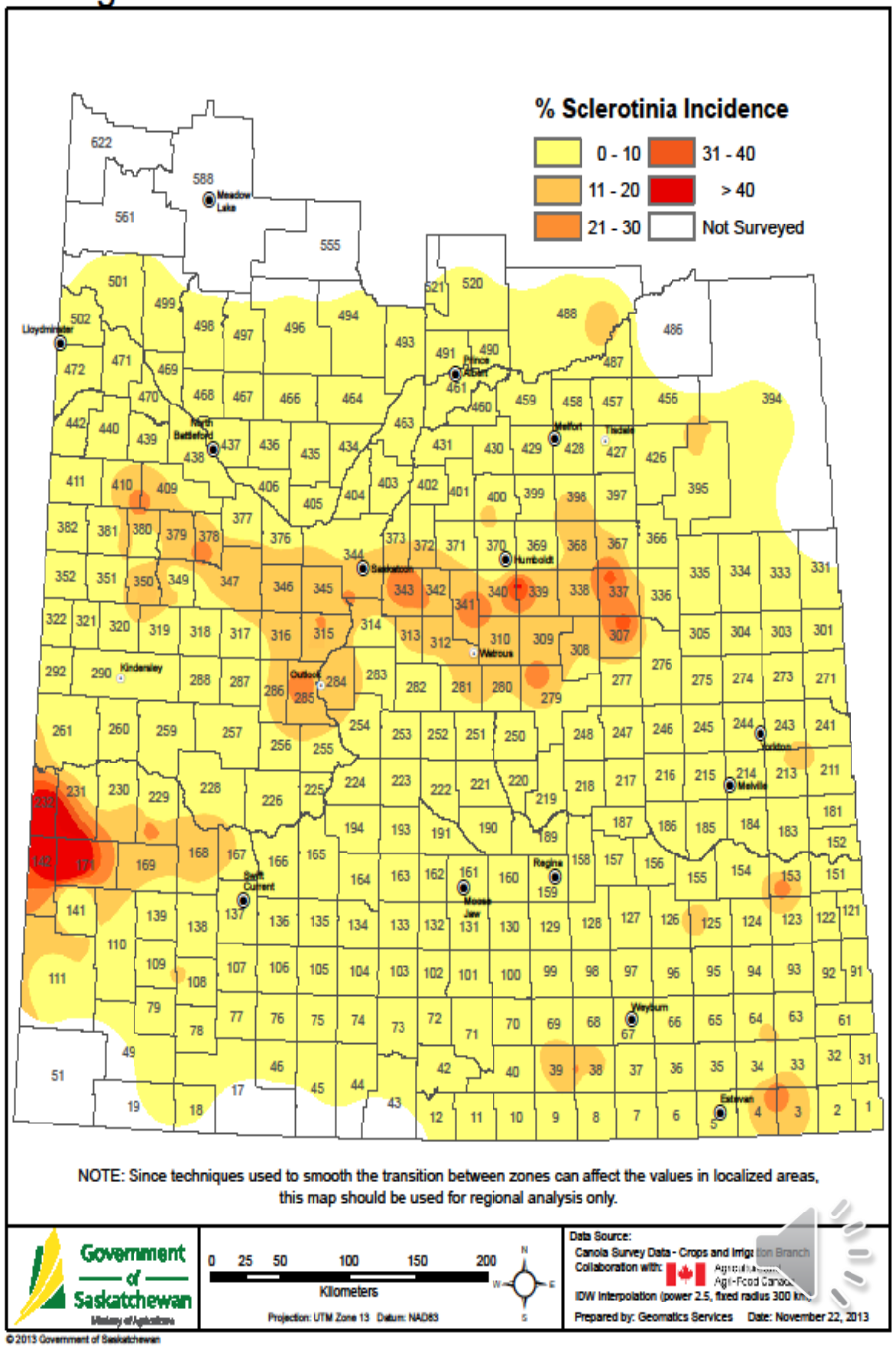


Average Percent Sclerotinia Incidence in Canola - 2013

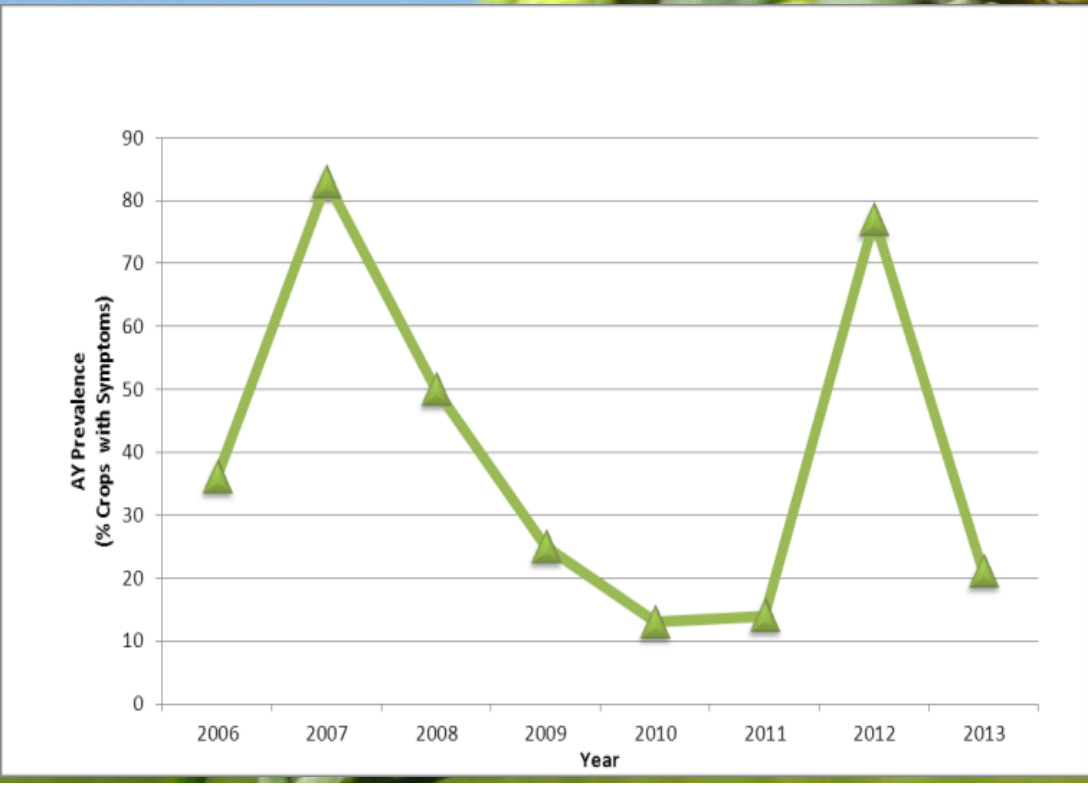


Sclerotinia

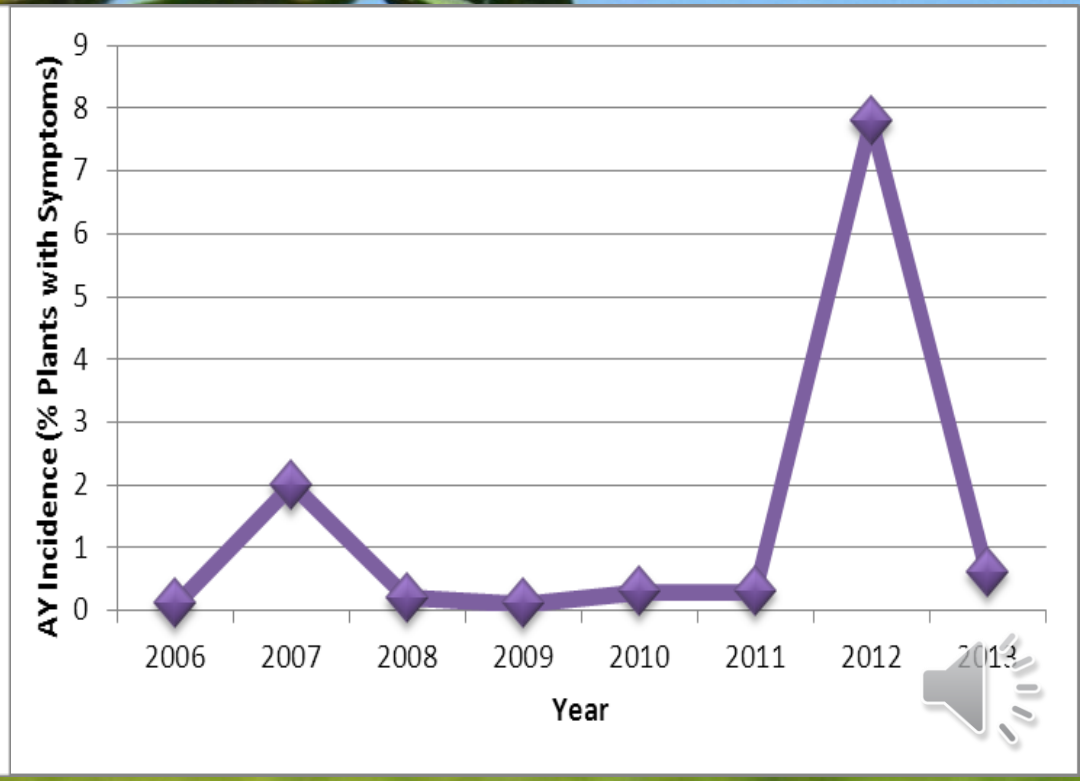
- Under high enough disease pressure and moisture/irrigation near flowering, canola will likely benefit from a fungicide application.
  - This will also vary depending on fungicide cost and commodity price.
  - Optimum spray window: 20-30% flowering
- Sclerotinia check-list
  - See CCC website (www.canolacouncil.org).

Aster Yellows

Prevalence 2006-2013



Incidence 2006-2013



Blackleg

- Blackleg (stem lesions and/or basal cankers) was observed in 31% of canola crops surveyed.
- Overall low severity.

Keep an eye on it!

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Ministry Crop Protection Laboratory

- Now equipped with PCR for DNA testing of soils samples collected during the Canola Disease Survey.
- Those who wish to have samples tested for clubroot outside of the survey may contact a private lab (www.clubroot.ca).
- Our lab also handles other disease diagnoses, insect, and weed ID.

Honourable Lyle Stewart, Minister of Agriculture, during the grand opening of the PCR lab in Regina

www.gov.sk.ca

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